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**REMARKS**

**Amendments Made to the Claims**

Claims 1 and 14 have been amended to make it clear that the casting surface (surface of the belt) is made of metal (the metal of the flexible metal belt introduced earlier in the claims). This amendment is supported by the specification generally and especially Figs. 3 and 4 and the Example beginning on page 12 (where a copper belt is textured with grooves).

Additionally, the wording of claim 14 has been improved by deleting the unnecessary reference to the casting surface in the third from last line.

**Examiner's Comments on Applicant's Arguments**

**(See pages 6 and 7 of the Office Action)**

In dismissing Applicant's arguments from the previous response of March 31, 2008, the Examiner stated:

"b. Applicant in junction para. between pages 10 and 11 of the response stated that it appears that the statement regarding surface roughness applied to layer A and the surface is prepared through grit blasting or laser roughness. However, Marti et al. in [0021] clearly refers to figure 3 which shows a **cylindrical surface**, rather than figure 2. The **cylindrical surface** is prepared through grinding or turning process, rather than by grit blasting or laser roughness as mentioned in

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[0015]. The turning process will produce a grooved structure."

It is true that, in para [0021] Marti et al. refers to a cylindrical surface, but it is not clear what the cylindrical surface is, i.e. whether it refers to the surface of layer A, B or C of Fig. 3. For ease of reference, the entire paragraph is reproduced below:

"[0021] Fig. 3 shows an enlarged section of a cylindrical surface, which is smoothly formed, preferably with a surface roughness of less than 6 micrometers, and especially less than 1 micrometer, and therefore has been fine machined by grinding or turning. In addition, the base material A is provided with a layer of material B, which preferably consists of nickel, steel, and/or chromium. The layer of material B and the layer of material C are applied by a thermal spraying process, for example, plasma spraying or flame spraying, by HIP cladding, or by another coating method, for example, electrolysis."

The Examiner seems to assume that the "cylindrical surface" is the surface of layer C, but this is not clear and is not consistent with the words: "In addition, the base material A is provided with a layer ..." These words make it appear that the "cylindrical surface" is the surface of layer A, which is then (after being smoothly formed by grinding or turning) is coated with layers B and C. This is reinforced by the statements that "The layer of material B and the layer of

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material C are applied by a thermal spraying process, for example, plasma spraying or flame spraying, by HIP cladding, or by another coating method, for example, electrolysis." It seems unlikely that layers produced in this way would be further machined by grinding or turning, especially as it is stated in paragraph [0025] that: "The surfaces 11', 12' of the casting rolls may also have a surface roughness of 6-10 micrometers and be provided only with the applied layer of material C without finishing."

However, if it is assumed for the sake of argument that the statement in paragraph [0021] does apply to the surface of layer C, then it is of importance to note that Fig. 3 shows a completely smooth surface on layer C, rather than a surface with depressions as in Fig. 2. Paragraph [0021] emphasizes that the surface is: "is smoothly formed, preferably with a surface roughness of less than 6 micrometers, and especially less than 1 micrometer" and is "fine machined", which implies that the intention is to provide a surface that is as smooth as possible. It is to be noted that the phrase "a surface roughness of less than 6 micrometers, and especially less than 1 micrometer" provides no lower limit for the roughness (unlike the claims of the present invention) and, along with the intention to make the surface "smoothly formed", this could imply an intention to make the roughness approach zero. Grooves, for their very existence, need a positive vertical dimension.

The Examiner also stated that "The turning process will produce a grooved structure", but this is not necessarily so.

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Turning can also be used to produce a very smooth finish, wherein the tool is moved slowly across the surface, moving all metal in front of it, and leaving an exceptionally smooth surface in its wake.

There is consequently no clear reference in Marti et al. to the formation of a plurality of grooves oriented in substantially the same direction and this is just an assumption on the part of the Examiner that has no clear basis in the reference itself.

#### **Claim Rejections - 35 USC §103**

The Examiner has rejected claims 1, 3-5, 7-10, 13, 14, 16-18, 20-24, and 27 as being unpatentable over US 6,581,675 to Harrington and further in view of US 2004/0045696 to Marti et al.

For the reasons given above, it is believed that the rejected claims cannot be considered obvious over a combination of Harrington and Marti et al. However, for the sake of argument (and without admission), it is submitted that the rejection is improper even if it is assumed that Marti et al. does, in the case of Fig. 3, show a surface roughness of less than 1 micrometer at the casting surface.

As noted above, the claims of this application have been amended to require the casting surface to be made of metal whereas, in all cases, the casting surface of Marti et al. is made of a ceramic material (layer C). The casting surface of Harrington is also a metal surface. The Examiner is therefore

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contending that it would have been obvious to a person of ordinary skill in the art to modify the metal casting belt of Harrington by imparting a surface roughness of less than 1 micrometer as taught by Marti et al. This contention, however, does not take into consideration the fact that Harrington and Marti et al. are not equivalent and that it would not be obvious to try such a substitution of features. Marti et al. provides a ceramic layer at the surface of the casting element (in this case a casting roll rather than a casting belt), and supplies a gas of a certain thermal conductivity to occupy the space between the casting surface and the molten metal. Given that metal and ceramics have very different thermal properties and that Harrington does not rely on the provision of a gas of particular thermal conductivity, it is not predictable that the effect achieved by Marti et al. would also be achieved if applied to the metal casting surface of Harrington.

The objective of Marti et al. is very specific. It is to overcome the disadvantage of the casting roll of EP-A-0 309 247 that provides uniformly distributed spaced depressions in the surface of the roll that result in the formation of bubbles during casting that prevent the formation of primary cracks, but create a surface roughness in the cast metal, as well as other disadvantages (paragraphs [0002] and [0003] of Marti et al.). The solution provided by Marti et al. is to feed a controlled amount of gas consisting of argon, nitrogen and/or another gas, during casting so that the heat transfer from the skin of the cast strip to the casting roll can be influenced by the thickness of the gaseous film which forms,

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"such that the surface of the casting roll may or may not be provided with depressions, and a smooth surface of the strip to be cast can be produced" (paragraph [0004] of Marti et al.). The teaching of Marti et al. is therefore that the feeding of a specific gas makes the provision of depressions in the ceramic surface irrelevant (they may be provided or not). If anything, a person of ordinary skill in the art would be tempted by Marti et al. to provide a specific gas during the casting process of Harrington to eliminate the need for grooves or other depressions to produce a cast strip having a flat surface. However, this effect is so specific to the ceramic coatings used by Marti et al. that even this combination would not lead to predictable results. It cannot therefore be predicted that, especially in the absence of a supply of the gas of Marti et al., a reduction of the size of the grooves of Harrington on a metal casting surface would have any beneficial effect.

Also, given that the belt of Harrington has a metal surface and the roll of Marti et al. has a ceramic surface, it cannot be predicted that depressions of a size effective for Marti et al. would be effective for Harrington. The ceramic coating of Marti et al. is a heat insulator. The metal of Harrington (and the present invention) is a heat-conductor. These two materials operate entirely differently when in contact with molten metal and it would not be reasonable to extrapolate the experience derived from one to the other, especially when the goal is to modulate the heat flux from the molten metal and to stabilize the molten metal meniscus (page 7, lines 24-28 of the present application). In short, the

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apparatus of Harrington and Marti et al. are so radically different in terms of their casting surfaces that it would not be apparent that the benefits achieved with one would be applicable to the other. It would not even be obvious to try the solution of Marti et al. in the apparatus of Harrington because it would be confusing as to whether this would involve providing the particular gas feed of Marti et al. and providing a ceramic coating, which would clearly affect the thermal characteristics of the casting operation of Harrington in an unpredictable manner.

Moreover, as pointed out in the introduction of the present application (page 1, line 22 to page 2, line 2), although it is known to provide a casting belt with porous ceramic coatings filled with a high conductivity inert gas, the expense of maintaining a consistent ceramic coating and the cost of the inert gas makes such procedures economically unattractive. This provides a disincentive to the modification of Harrington by the provision of a ceramic surface of Marti et al. and the use of a specific gas during casting. Even if such a modification were made, the result would not fall within the claims of the present application, which requires a metal casting surface.

This difference makes Marti et al. irrelevant to the claimed invention both alone and when considered in the light of Harrington.

In summary, the Examiner's case is that the claimed invention is made obvious by a reference disclosing metal

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casting belts and mentioning grooving without giving any further information or specific advantage, in combination with a reference that, if interpreted as broadly as possible in the Examiner's favor, mentions depressions that may be less than one micrometer or not present at all (without any unambiguous statement that the depressions may be grooves oriented in the same direction) but only in a ceramic layer that requires the use of specific gases. It is apparent that a person of ordinary skill in the art would find such references of relevance to the present invention only with the benefit of hindsight and, without this, there could be no expectation of advantage or success.

The Examiner also rejected claims 11, 12, 25 and 26 as being unpatentable over US 6,581,675 to Harrington in view of US 2004/0045696 to Marti et al. and further in view of US 5,636,681 to Sulzer et al. Reconsideration of this rejection is requested for the following reasons.

Claims 11, 12, 25 and 26 are dependent (directly or indirectly) on one or other of claims 1 and 14. Claims 1 and 14 are believed to be patentable for the reasons given above. Accordingly, it is believed that claims 11, 12, 25 and 26 are patentable for the same reasons as claims 1 and 14.

The Examiner also provisionally rejected claims 1, 3-10, 13, 14, 16-24 and 27 as being unpatentable over applicant's co-pending application S.N. 10/574,459 ("application '459") in view of US 6,581,675 to Harrington and US 2004/0045696 to



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Marti et al. Reconsideration of this rejection is requested for the following reasons.

It is noted that co-pending application S.N. 10/574,459 issued to patent on June 3, 2008 as patent no. US 7,380,583.

This provisional rejection of these claims was made under 35 U.S.C. §103(a). Accordingly, applicant is hereby submitting a Statement Concerning Common Ownership of the present application and application '459. Since this Statement, under 35 U.S.C. §103(c), will remove application '459 as a reference citable against the present application, the Examiner's rejection is now moot.

The Examiner also provisionally rejected claims 11, 12, 25 and 26 as being unpatentable over applicant's co-pending application S.N. 10/574,459 in view of US 6,581,675 to Harrington, US 2004/0045696 to Marti et al and US 5,636,681 to Sulzer et al. Reconsideration of this rejection is requested for the following reasons.

It is also believed that this rejection is now moot in view of the Statement Concerning Common Ownership as submitted herewith.

#### **Claim Rejections - Non-statutory Obviousness-type Double Patenting**

The Examiner also provisionally rejected claims 1, 3-10, 13, 14, 16-24 and 27 on the grounds of non-statutory obviousness-type double patenting over claims 1-17 of applicant's co-pending application S.N. 10/574,459 and further

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in view of US 6,581,675 to Harrington and US 2004/0045696 to Marti et al. The Examiner also provisionally rejected claims 11, 12, 25 and 26 on the grounds of non-statutory obviousness-type double patenting over claims 1-17 of applicant's co-pending application S.N. 10/574,459 and further in view of US 6,581,675 to Harrington, US 2004/0045696 to Marti et al. and US 5,636,681 to Sulzer et al.

As noted above, application '459 has issued as patent no. US 7,380,583. Without comment on the appropriateness of these rejections, and for the sake of expediency alone, Applicant has executed and hereby submits a Terminal Disclaimer relevant to patent no. US 7,380,583. Accordingly, these provisional rejections are now moot.

In view of the amendments and comments made above, favorable reconsideration of this application is requested.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicant's undersigned attorney invites the Examiner to telephone him at the number provided below.

No fees, other than the fee for the Request For Continued Examination and the fee for the Terminal Disclaimer, are deemed necessary in connection with the filing of this Amendment. However, if any other fees are required, authorization is hereby given to charge the amount of any such

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fees to Deposit Account No. 03-3125.

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